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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/981,389	10/17/2001	David Graumann	PW 027 6903 P12451	6813

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EXAMINER

FAULK, DEVONA E

ART UNIT	PAPER NUMBER
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2644

DATE MAILED: 09/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/981,389

Applicant(s)

GRAUMANN, DAVID

Examiner

Devona E. Faulk

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. **Claims 1-5,7-10,12-16** are rejected under 35 U.S.C. 102(e) as being anticipated by Birchfield et al. (U.S. Patent Application 2002/0097885).

Regarding **claim 1**, Birchfield discloses an acoustic source localization system and method comprising a first microphone (302A; Figure 3) located at a first location to detect acoustic waves at the first location; a second microphone (302B; Figure 3) located at a second location to detect the acoustic waves at the second location; at least one acoustically reflective surface to reflect the acoustic waves (paragraph 0038); an acoustic analysis device to detect and analyze acoustic waves (330. paragraph 0039; Figure 3); a processing device to determine a spatial location of a source of the acoustic waves (340; paragraph 0042).

Regarding **claim 2**, Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). A human has ears, and the ears read on at least one acoustically reflective surface having an irregular shape.

Therefore, all elements of claim 2 are comprehended by claim 1.

Regarding **claim 3**, Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). A human has ears, and the ears read on at least one acoustically reflective surface shaped like a human pinnea. Therefore, all elements of claim 3 are comprehended by claim 1.

Regarding **claim 4**, Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). A human has ears, and the ears read on at least one acoustically reflective surface having low acoustic absorption properties. Therefore, all elements of claim 4 are comprehended by claim 1.

Regarding **claim 5**, Birchfield discloses a processing device that directs an observation device in a direction of the spatial location of the source of the acoustic waves (paragraph 0072).

Regarding **claim 7**, Birchfield discloses an acoustic source localization system and method comprising using a first microphone (302A; Figure 3) to detect acoustic waves at the first location; using a second microphone (302B; Figure 3) to detect the acoustic waves at the second location; using at least one acoustically reflective surface to reflect the acoustic waves in a direction of the first location and the second location (paragraph 0038); analyzing the acoustic waves (330. paragraph 0039; Figure 3); determining a spatial location of a source of the acoustic waves (340; paragraph 0042). The method is inherent in the functionality of the system.

Regarding **claim 8**, Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). A human has ears, and the ears read on at least one acoustically reflective surface having an irregular shape. Therefore, all elements of claim 2 are comprehended by claim 7.

Regarding **claim 9**, Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). A human has ears, and the ears read on at least one acoustically reflective surface having low acoustic absorption properties. Therefore, all elements of claim 4 are comprehended by claim 7.

Regarding **claim 10**, Birchfield discloses directing an observation device in a direction of the determine spatial location of the source of the acoustic waves (paragraph 0072).

Regarding **claim 12**, Birchfield discloses an acoustic source localization system and method comprising a computer-readable medium (RAM; paragraph 0037); a computer-readable program code, stored on the computer-readable medium (paragraph 0037); having instructions to use a first microphone (302A; Figure 3) to detect acoustic waves at the first location; to use a second microphone (302B; Figure 3) to detect the acoustic waves at the second location; reflect the acoustic waves in a direction of the first microphone and second microphone (paragraph 0038); analyze the acoustic waves (330. paragraph 0039; Figure 3); determining a spatial location of a source of the acoustic waves (340; paragraph 0042).

Regarding **claim 13**, Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). A human has ears, and the ears read on wherein at least one acoustically reflective surface is utilized to reflect the acoustic waves. Therefore, all elements of claim 13 are comprehended by claim 12.

Regarding **claim 14**, Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). A human has ears, and the

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ears read wherein on at least one acoustically reflective surface having an irregular shape.

Therefore, all elements of claim 2 are comprehended by claim 13.

Regarding **claim 15**, Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). A human has ears, and the ears read on wherein at least one acoustically reflective surface has low acoustic absorption properties. Therefore, all elements of claim 4 are comprehended by claim 13.

Regarding **claim 16**, Birchfield discloses wherein the computer-readable program code includes instructions to direct an observation device in a direction of the determine spatial location of the source of the acoustic waves (paragraph 0037; paragraph 0072).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claim 17** is rejected under 35 U.S.C. 103(a) as being unpatentable over Birchfield et al. (U.S. Patent Application 2002/0097885).

Claim 17 claims the sound location detection system of claim 12, wherein the computer-readable program code includes instructions to set a first delay to delay an output of the first microphone and a second delay to delay an output of the second microphone, based upon the spatial location of the source of the acoustic waves. As stated above apropos of claim 1, Birchfield meets all elements of that claim. Therefore, Birchfield meets all elements of claim 6 with the exception of the claimed matter.

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Birchfield teaches of a computer-readable medium and program code that implements the processing of the acoustic location analyzer (310) (paragraph 0037). He also discloses that the microphones are space apart from the acoustic source and each other (Figure 3; paragraph 0034) and teaches of time delay (paragraph 0047). There is obviously a delay difference according to each microphone position. It would have been obvious to one of ordinary skill in the art to have the program code to set a first and second delay as claimed since delay data is essential to the localization process.

5. **Claims 6,11,18-26** are rejected under 35 U.S.C. 103(a) as being unpatentable over Birchfield et al. (U.S. Patent Application 2002/0097885) in view of Burks et al. (U.S. Patent 6,014,510).

Claim 6 claims the sound location detecting system according to claim 1, further including a calibration device to create a set of phase signature tables associating phase angles, between when the acoustic waves reach the first microphone and when the acoustic waves reach the second microphone, with detected frequencies at a predetermine spatial location. As stated above apropos of claim 1, Birchfield meets all elements of that claim. Therefore, Birchfield meets all elements of claim 6 with the exception of the claimed matter. Birchfield discloses computing phase angles corresponding to microphone position (paragraph 0058). Burks discloses the concept of creating a phase table having a period for each phase with its associated phase tag (column 5, lines 24-33). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Burks concept of creating a phase table in order to have a more robust system.

Claim 11 claims the method of claim 7, further including creating a set of phase signature tables associating phase angles, between when the acoustic waves reach the first location and when the acoustic waves reach the second location, with detected frequencies at a predetermine location. As stated above apropos of claim 7, Birchfield meets all elements of that claim. Therefore, Birchfield meets all elements of claim 11 with the exception of the claimed matter. Birchfield discloses computing phase angles corresponding to microphone position (paragraph 0058). Burks discloses the concept of creating a phase table having a period for each phase with its associated phase tag (column 5, lines 24-33). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Burks concept of creating a phase table in order to have a more robust system.

Claim 18 claims the sound location detecting system according to claim 12, wherein the computer-readable program code includes instructions to create a set of phase signature tables associating phase angles, between when the acoustic waves reach the first location and when the acoustic waves reach the second location, with detected frequencies at a predetermine spatial location. As stated above apropos of claim 12, Birchfield meets all elements of that claim. Therefore, Birchfield meets all elements of claim 18 with the exception of the claimed matter. Birchfield discloses computing phase angles corresponding to microphone position (paragraph 0058). Burks discloses the concept of creating a phase table having a period for each phase with its associated phase tag (column 5, lines 24-33). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Burks concept of creating a phase table in order to have a more robust system.

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6. Regarding **claim 19**, Birchfield discloses emitting acoustic waves of known frequencies from predetermine spatial locations (Figure 3; paragraph 0042); using a first microphone (302A; Figure 3) to detect acoustic waves at the first location; using a second microphone (302B; Figure 3) to detect the acoustic waves at the second location; determining a phase angle between when the acoustic waves reach the first location and when the acoustic waves reach the second location, for each of known (paragraph 58); associating the phase angles with the known frequencies at each of the predetermine spatial locations (paragraph 0042; paragraph 0058) . Although he teaches on the above named elements, Birchfield fails to disclose creating a phase signature table with the data. However, the concept of creating a phase table was well known in the art at the time of filing). Burks discloses the concept of creating a phase table having a period for each phase with its associated phase tag (column 5, lines 24-33). The method is obvious in the functionality of the system. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Burks concept of creating a phase table in order to have a more robust system.

Claim 20 claims the method of claim 19 further including reflecting the acoustic waves in a direction of each of the first location and the second location. As stated above apropos of claim 19, the combination of Birchfield and Burks meets all elements of that claim. Therefore, the combination meets all elements of claim 20 with the exception of the claimed matter. Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). A human has ears, and the ears read on further including reflecting the acoustic waves in ea direction of each of the

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first location and the second location. All elements of claim 20 are comprehended by claim 19. Therefore, claim 20 is rejected for reasons given above apropos of claim 19.

Claim 21 claims the method of claim 20, wherein at least one irregularly shaped surface is utilized to reflect the acoustic waves. As stated above apropos of claim 19, the combination of Birchfield and Burks meets all elements of that claim. Therefore, the combination meets all elements of claim 20 with the exception of the claimed matter. Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). A human has ears, and the ears read on the claim language. All elements of claim 21 are comprehended by claim 20. Therefore, claim 21 is rejected for reasons given above apropos of claim 20.

Claim 22 claims the method of claim 21, wherein at least one irregularly shaped surface is shaped like a human pinnea. As stated above apropos of claim 21, the combination of Birchfield and Burks meets all elements of that claim. Therefore, the combination meets all elements of claim 22 with the exception of the claimed matter. Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). A human has ears, and the ears read on the claim language. All elements of claim 22 are comprehended by claim 21. Therefore, claim 22 is rejected for reasons given above apropos of claim 21.

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7. Regarding **claim 23**, Birchfield discloses an acoustic source localization system and method comprising a computer-readable medium (RAM; paragraph 0037). Birchfield further discloses emitting acoustic waves of known frequencies from predetermine spatial locations (Figure 3; paragraph 0042); using a first microphone (302A; Figure 3) to detect acoustic waves at the first location; using a second microphone (302B; Figure 3) to detect the acoustic waves at the second location; determining a phase angle between when the acoustic waves reach the first location and when the acoustic waves reach the second location, for each of known (paragraph 58); associating the phase angles with the known frequencies at each of the predetermine spatial locations (paragraph 0042; paragraph 0058). Although he teaches on the above named elements, Birchfield fails to disclose creating a phase signature table with the data. However, the concept of creating a phase table was well known in the art at the time of filing). Burks discloses the concept of creating a phase table having a period for each phase with its associated phase tag (column 5, lines 24-33). The method is obvious in the functionality of the system. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Burks concept of creating a phase table in order to have a more robust system.

Claim 24 claims the phase signature table creation device according to claim 23, wherein the computer-readable program code includes instructions to reflect the acoustic waves in a direction of each of the first location and the second location. As stated above apropos of claim 23, the combination of Birchfield and Burks meets all elements of that claim. Therefore, the combination meets all elements of claim 25 with the exception of the claimed matter. Birchfield Birchfield teaches that in some applications it is desirable

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to determine the direction of a human speaker (paragraph 0038). A human has ears, and the ears read on the claim language. All elements of claim 24 are comprehended by claim 23. Therefore, claim 24 is rejected for reasons given above apropos of claim 23.

Claim 25 claims the method of claim 23, wherein at least one irregularly shaped surface is utilized to reflect the acoustic waves. As stated above apropos of claim 23, the combination of Birchfield and Burks meets all elements of that claim. Therefore, the combination meets all elements of claim 25 with the exception of the claimed matter. Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). A human has ears, and the ears read on the claim language. All elements of claim 25 are comprehended by claim 23. Therefore, claim 25 is rejected for reasons given above apropos of claim 23.

Claim 26 claims the method of claim 23, wherein at least one irregularly shaped surface is shaped like a human pinnea. As stated above apropos of claim 23, the combination of Birchfield and Burks meets all elements of that claim. Therefore, the combination meets all elements of claim 26 with the exception of the claimed matter. Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). Birchfield teaches that in some applications it is desirable to determine the direction of a human speaker (paragraph 0038). A human has ears, and the ears read on the claim language. All elements of claim 26 are comprehended by claim 23. Therefore, claim 26 is rejected for reasons given above apropos of claim 23.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent 6,469,732 to Chang et al. discloses an acoustic source location using a microphone array.

U.S. Patent 6,774,934 to Belt et al. discloses a signal localization arrangement.

U.S. Patent 5,778,082 to Chu et al. discloses a method and apparatus for localization of an acoustic source.

U.S. Patent 5,844,997 to Murphy, Jr. discloses a method and apparatus for locating the origin of intrathoracic sounds.

U.S. Patent 6,516,066 to Hayashi discloses an apparatus for detecting direction of sound source and turning microphone toward sound source.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Devona E. Faulk whose telephone number is 703-305-4359. The examiner can normally be reached on 8 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W. Isen can be reached on 703-305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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